

## **GAS DELIVERY SYSTEM FOR SEMICONDUCTOR PROCESSING**

### **ABSTRACT OF THE DISCLOSURE**

The present invention is directed to improving defect performance in semiconductor processing systems. In specific embodiments, an apparatus for processing semiconductor substrates comprises a chamber defining a processing region therein, and a substrate support disposed in the chamber to support a semiconductor substrate. At least one nozzle extends into the chamber to introduce a process gas into the chamber through a nozzle opening. The apparatus comprises at least one heat shield, each of which is disposed around at least a portion of one of the at least one nozzle. The heat shield has an extension which projects distally of the nozzle opening of the nozzle and which includes a heat shield opening for the process gas to flow therethrough from the nozzle opening. The heat shield decreases the temperature of nozzle in the processing chamber for introducing process gases therein to reduce particles.

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